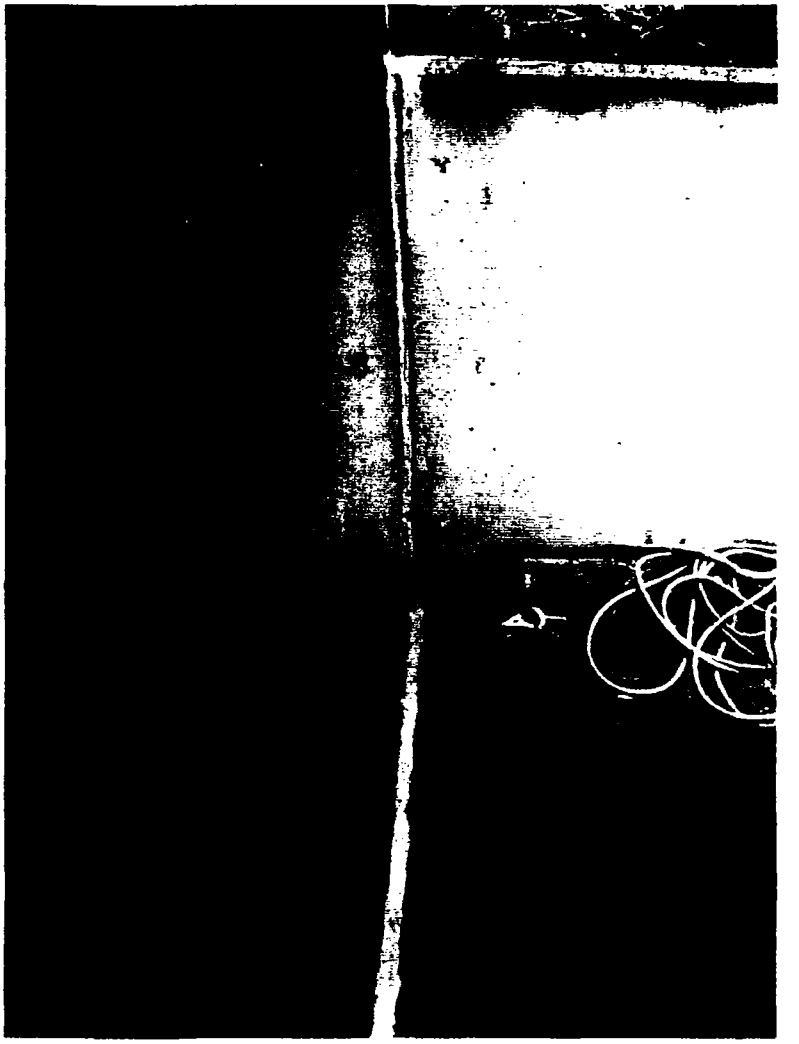
KOOTENAI DEVELOPMENT IMPOUNDMENT DAM

NOVEMBER 9TH, 2007 ROUTINE INSPECTION REPORT



BILLMAYER & HAFFERMAN ENGINEERING INC.

February 22, 2008

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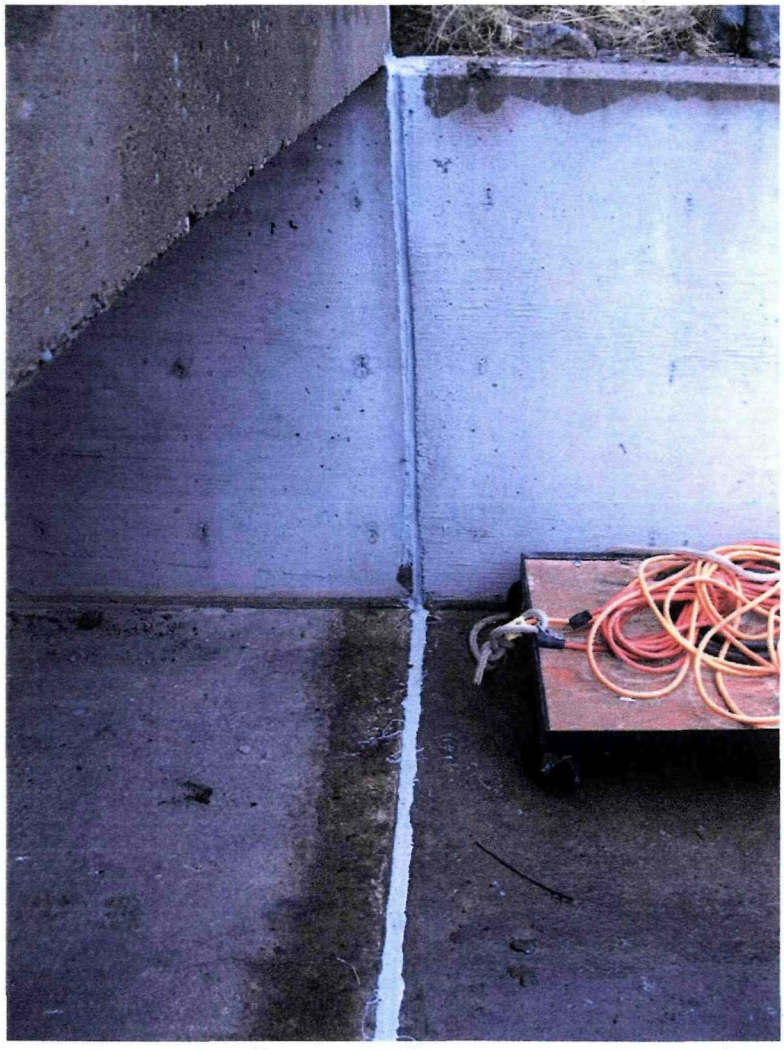


BILLMAYER & HAFFERMAN ENGINEERING INC.

February 22, 2008

BH BILLMAYER & HAFFERMAN, INC.

February 22, 2008

Bob Marriam
C/o The Remedium Group
6401 Poplar Ave., Suite 301
Memphis, TN. 38119

RE: Fall 2007 Maintenance Work; Drain Investigation

Dear Bob,

I have compiled the results of our routine inspection work on the Kootenai Impoundment Dam from our November 8th, 2007, December 26th, 2007 and February 7th, 2008 site visits. Executive summaries are attached to this letter. Site visits were made by me and with Jeff Robertson of Chapman Construction. The February 7th, 2008 inspection was made on snowmobiles and was rather strenuous and potentially perilous due to the extremely deep snow. It is anticipated that the March 2008 site visit will also need to be made with snowmobiles. We are planning to also take snowshoes in March so that we can get better access to all the piezometers.

I have also included a short report on the need to complete the camera investigation of the drains. Based on our discussions that the EPA is reluctant to allow any removal of vegetation at the toe of the dam around the drains, I have modified my proposal that I presented in the September 26th, 2007 report to include a means to investigate the drains without removing any further vegetation. I have proposed a work plan and budget.

Your concurrence with the schedule and budget and permission to implement the toe drain camera investigation project is requested. We are currently planning to make a routine inspection March 14th.

Respectfully,

Billmayer & Hafferman Engineering Inc.
Kurt Hafferman

Cc: File: R.56.1
Enclosure: Inspection Reports for November 9th, 2007 December 26th, 2007 and, February 7th, 2008
Executive Summaries for November 9th, 2007 December 26th, 2007 and, February 7th, 2008
Drain Investigation Proposal

2191 Third Ave. East • P.O. Phone: 406-257-8708 Fax: 406-257-8710

EXECUTIVE SUMMARY

A fall 2007 site inspection and routine monitoring site visit was made Thursday, November 9th, 2007. Projects completed included;

1. Obtain Piezometer readings
2. Read V-notch weirs below the drain outlets.
3. Read staff gauge in the drain outlet channel.
4. Calculate the drain flow
5. Measure total discharge in the outlet channel.
6. Inspect Spillway Repairs made by Chapman Construction
7. Map the Crack in the Box Culvert

The piezometer readings were normal with no anomalies found in any reading.

The staff gauge in the stream below the toe drains was recorded at 0.785 ft. and a stream flow measurement was made and the flow was calculated to be 0.289 cfs (130.1 gpm). All of the drains were flowing at the normal flow rate and no anomalies were found in the drain flow. During the September 26th site inspection, it was discovered that the inside of many of the drains were clogged with either roots, debris or both. In preparation for developing a scheme to obtain a camera view inside of each drain, all of the drains were cataloged and a photograph of the outside and inside of each drain was made.

The piezometer data and drain flow data has been entered into the monitoring spreadsheet. Plots of the piezometers and the drain flow are provided in the report.

All of the transverse joints in the box culvert had been cleaned and caulked. Chapman Construction is continuing to work on the caulking of the cracks in the open chute spillway.

The crack in the center of the box culvert was mapped from the entrance to the outlet. Photographs were made at each measurement point and a map of the crack was plotted. Photographs, measurement data, and the plot are included in the report.

INTRODUCTION

The Kootenai Development Impoundment Dam is an earthen tailings impoundment dam located in the NW ¼ of Section 22 in Township 31 North, Range 30 West in Lincoln County, Montana. The dam is located at the confluence of Rainy Creek and Fleetwood Creek, which are tributary to the Kootenai River.

On Thursday November 9th, 2007 a routine monitoring was completed on the project. Those in attendance were Kurt Hafferman from Billmayer & Hafferman Engineering, and Jeff Robertson from Chapman Construction.

The Kootenai Development Impoundment Dam is located on a US EPA Superfund site and access to the dam is restricted. The on site hazard is asbestos. All personnel involved in this inspection are 40-Hour HAZWOPER trained, are medically monitored, are medically certified to wear respirators, and have all been fit tested for appropriate respirators.

The purpose of the project was to complete routine inspection and develop a plan and schedule for completing the future maintenance.

HAZARDOUS WASTE AND EMERGENCY OPERATIONS (HAZWOPER) PLAN

The HAZWOPER Project manager and Field Leader for this site inspection was Kurt Hafferman. The decontamination supervisor and field assistant and the Health and Safety Officer was Jeff Robertson. Site security was provided by the US EPA at the entrance to the project. The Personal Protective Equipment (PPE) used was North Full Face® respirators with P-100 filters (purple), double layer Tyvek® suits with Tyvek® booties, cotton glove liners with rubber outer gloves and rubber over booties.

SITE INSPECTION RESULTS

Copies of the field notes are shown in Exhibit 1 to this report. The sections below provide the additional detail to field notes for this Routine Inspection Report.

Reservoir

There was water in the reservoir to but it was approximately 1000 ft. away from the upstream face of the dam on the date of the inspection. There was no water at the base of piezometer P-O. There was nothing unusual noted in the reservoir or on either side of the reservoir, near the dam or in the drainage above the reservoir.

Piezometers:

All piezometers were located and a reading was obtained from each one except P-O. Piezometers P, P1, P3, PM4, PM5, and PM6 were noted as dry. These piezometers have been noted as being dry in all other readings. Piezometers P4, P5, and PM3 were reported to have water in them but there was less than 0.10 ft. difference between the bottom of the piezometer and the free water surface and it is assumed that this is most likely rain water, minor seepage or other accumulations of water not related to the phreatic water surface in the embankment. These piezometers have been reported as being dry or as having less than 0.10 ft. of water depth in all other previous readings. Piezometer P-O was not read on the day of this inspection.

Piezometers P2, PM1, PM2, and A8 were the only piezometers that had water in them that appears related to the phreatic water surface in the dam. The readings from these piezometers were transposed to an Excel spreadsheet and the individual piezometer graphs were updated. Copies of the data and graphs are shown in Exhibit 2 on page E1-1 to E2-5.

Concrete Box Culvert

The box culvert trash rack, which is made up of 13 – I-beams driven vertically into the soil, was clean of debris.

The inside of the box culvert was inspected from the entrance to the exit. The crack in the invert of the culvert that runs the full length of the culvert was noted as having no change from the spring inspection.

The invert crack runs down the centerline of the box culvert. In order to monitor the crack a baseline map needed to be developed that plotted the location, crack width and crack depth at each location. This project was completed during this site visit. The crack was mapped from the entrance to the outlet. A 300 ft. fiberglass tape with a ± 0.01 ft. accuracy was used to measure the distance from the inlet to a measurement point. A steel tape with a $1/16^{th}$ inch (0.005 ft.) accuracy was used to measure the distance from the right side wall of the box culvert to the center of the crack. A Starrett Dial Calipers with a 0.001 inch (0.0001 ft.) accuracy was used to measure the crack width at each measurement point.

The crack measurement data was entered into and Excel® spreadsheet and a plot of the crack was made using the measurement data. The measurement data and plot is included in Exhibit 3 to this report. The data recorded and the plot will serve as a base line for future monitoring of the crack. It is anticipated that the crack may expand in the spring when the snow melts and causes the infiltrating water to heave the bottom so the crack widths will be checked in the spring of 2008. It is also possible that the crack contracts after spring runoff so the crack widths will again be checked in the fall of 2008 during the five year operational permit inspection. It was also noted during the mapping that there are several locations along the crack where the floor is vertically displaced. Again, these are items that will be checked in the spring and fall of 2008.

The transverse expansion cracks throughout the box culvert have been cleaned and re-caulked by Chapman Construction. A photograph of the first transverse joints located 42 ft. from the entrance is shown in Figure 1 below;

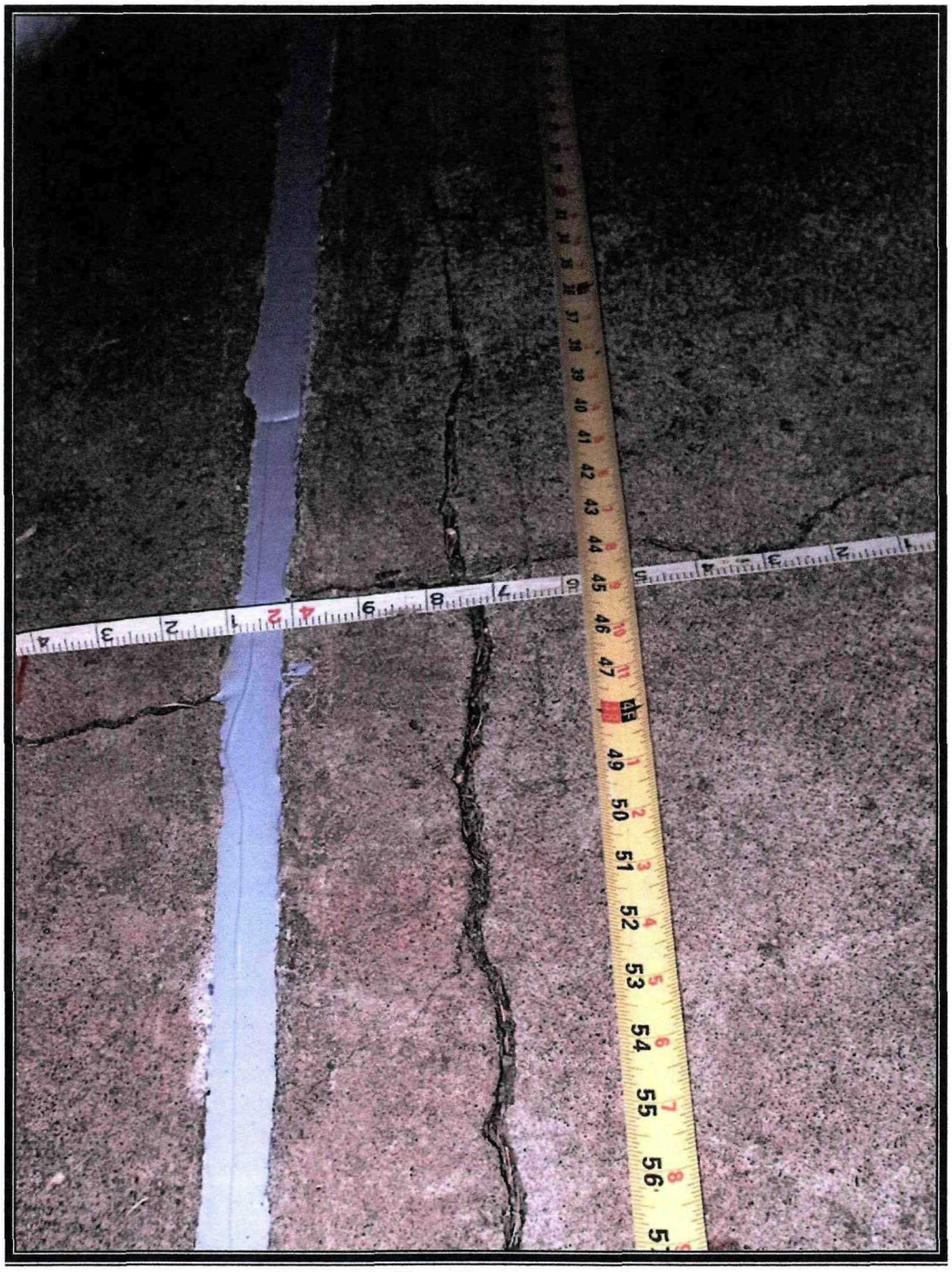


Figure 1 First Transverse Joint

Open Concrete Chute Spillway

The open chute spillway was inspected from the outlet of the box culvert to the top of the steep section of the chute. The sidewall load cracks and the pieces of the wall top that had spalled or cracked off are currently being repaired by Chapman Construction. The means and methods used to complete the repairs were discussed with Chapman Construction. All of the side wall load cracks and the stress cracks are being ground out with a diamond tipped blade on a hand held grinder. The cracks are being cleaned and then filled with a Sika Flex™ caulk. Each of the transverse construction joints are also being cleaned out and filled with the Sika Flex™ caulk. A photograph of the first transverse joint at the outlet from the box culvert is shown in Figure 2 below;

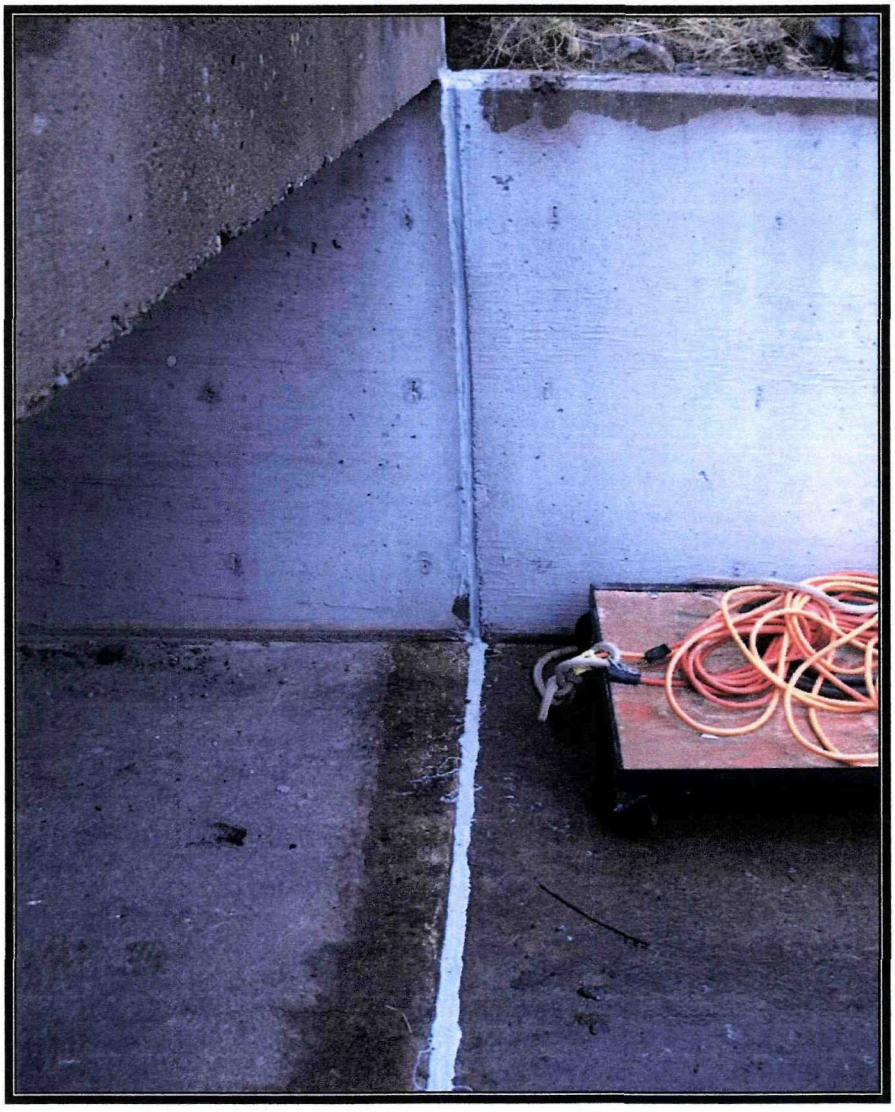


Figure 2 Transverse Joint at Start of Open Chute Spillway

There was no water running in the steep section of the spillway so the chute was inspected. The chute appeared to be in good condition and no large cracks, displacements or anomalies were noted in the spillway floor or side walls.

Dam Crest

The crest of the dam was inspected from the right to the left side. There was no misalignment, bulges or depressions noted in the crest. Chapman Construction has removed the small brush on the crest and alignment of the crest is much easier.

Upstream Face

The upstream face of the dam was inspected from the right to the left side. The work completed to remove the small cottonwoods, old stumps, a couple of small pine trees, and some weeds growing all along the upstream face of the dam was reviewed with Chapman Construction. The cleaning makes it much easier to see the upstream face and the piezometers. There was no misalignment, bulges or depressions noted in the upstream face.

Downstream Face

The downstream face was inspected by walking each of the lift lines on the face. There was no misaligned sections, no bulges, cracks or significant erosion noted anywhere on the downstream face.

Toe Drains

The following toe drains were located and checked. There is no difference in the flow or appearance of the drains since the September 26th inspection. Photographs were made of each of the drains and are shown below and are also included in project photographs in Exhibit 4.

Drain 1: A 12-inch Corrugated Metal Pipe (CMP) in the left groin. The drain was dry. Brush and weeds have been cleaned near each outlet. A photograph of outside and inside of Drain 1 on the day of the inspection is shown below;

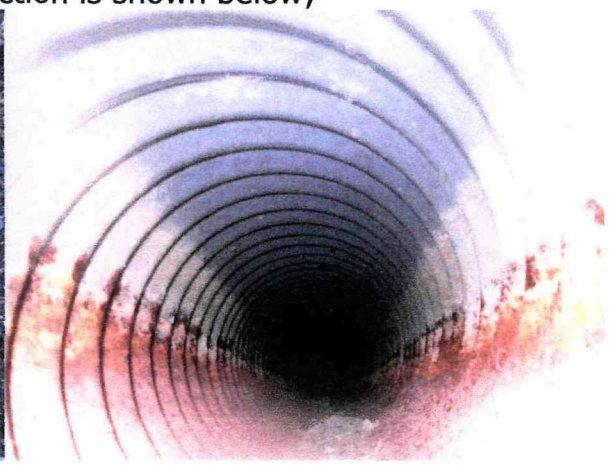


Figure 3: Drain 1 outside and inside

Drain 2: A 12-inch CMP in the left groin. The drain has a small amount of running water and was moist inside. The flow was estimated to be between 3 gpm and 5 gpm. Brush and weeds were cleaned near the outlet. A photograph of the outside and inside of the pipe in shown in Figure 4 below.

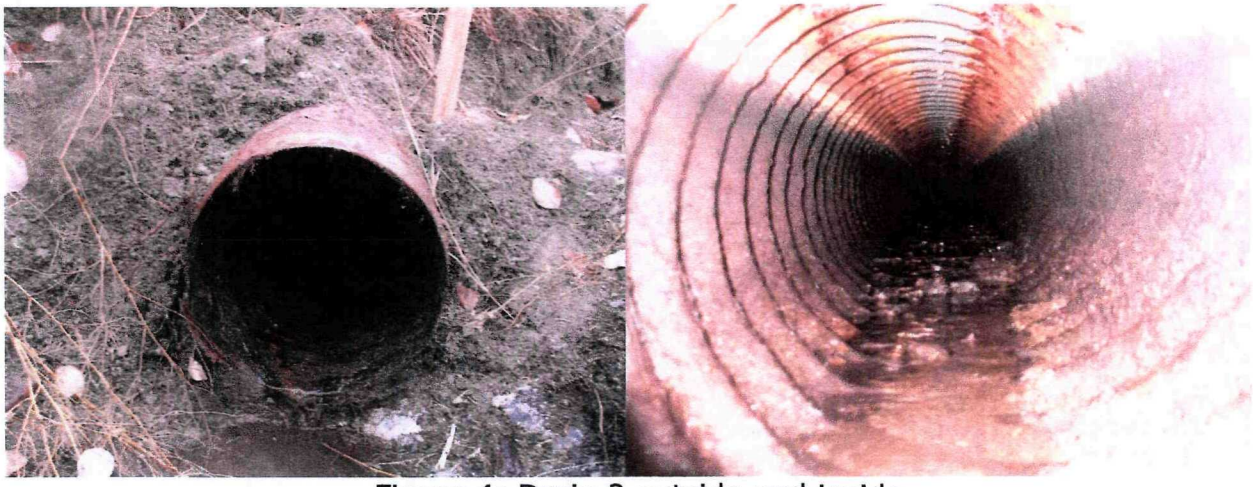


Figure 4: Drain 2 outside and inside

Drain 3: Is an 8-inch concrete pipe near the left groin. The drain was not running water but there was water on the outside and at the toe of the drain. Brush and weeds were cleaned near the outlet. A photograph of the outside and inside of the drain is shown in Figure 5 below. There appears to be a blockage or displacement in the pipe as shown.

Figure 5: Drain 3 outside and inside

Drain 4: An 8-inch concrete pipe, with the end sticking out, in the left side, approximately 50 feet from left groin. The drain was flowing water that was estimated at approximately 3 gpm to 5 gpm. A photograph of the outside and inside of the drain in shown in Figure 6 below;

Figure 6: Drain 4 outside and inside

A 1-ft. Rectangular-notch weir was set in the drain channel below drain 1, 2, 3, and 4. The 1 foot rectangular weir read 0.5 inches 2 hours after being set which is equal to 12.6 gpm. A photograph of the weir immediately after it was set is shown in Figure 7 below:

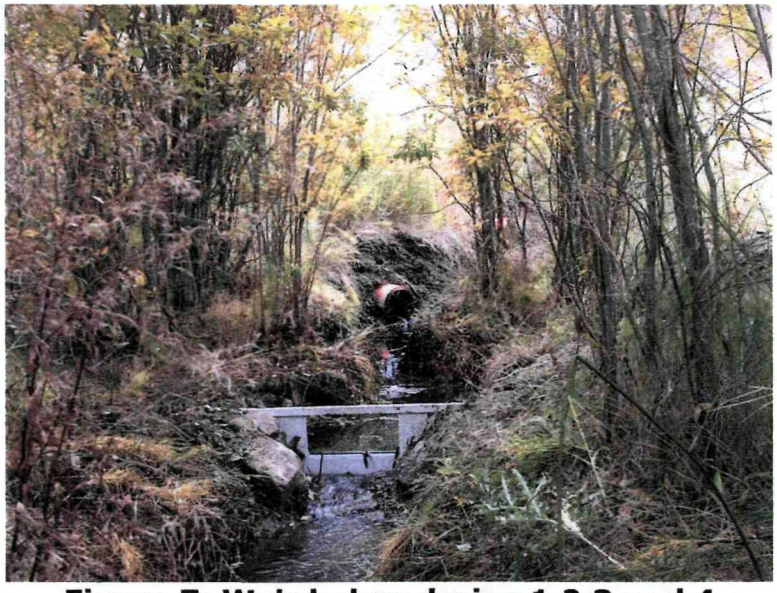


Figure 7: Weir below drains 1,2,3,and 4

Drain 5: Drain 5 is a 12-inch CMP pipe projecting from the face of the embankment. The drain is near the center of the embankment. The pipe was running water and the depth of the water was measured at 0.18 feet deep. A V-notch weir was set below the pipe. A photograph of the pipe is shown in Figure 8 below. A photograph of the weir is shown in Figure 9 below.

Figure 8: Drain #5 outside and inside

Figure 9: Drain #5 and V-Notch weir below the drain

The V-notch weir read 1.0 inches 2 hours after the weir was set. A reading of 1.0 inches is equal to 2.35 gpm.

Drain 6: Drain 6 is a 12 inch steel pipe projecting out from the embankment approximately 3 ft. This drain is located in the center of the embankment and is the highest flowing drain in the toe drain system. The drain flow is monitored by

measuring from the inside top of the pipe to the water surface. A photograph of drain 6 is shown in Figure 10 below. The measurement was 11-5/8 inches below the top inside of the pipe.

Figure 10: Drain 6 Outside

Drain 7 and Drain 8: The top drain, Drain 7, is 8-inch concrete pipe near the centerline of the embankment. This drain was originally labeled as drain 6 and is hereinafter labeled as Drain 7. This drain was dry and appeared full to the crown of the pipe with either moss or tree roots. After cleaning brush from Drain 7, a second drain, originally labeled 6a, hereinafter called Drain 8, was located below Drain 7. This drain was discharging water into the channel below the pipe. It is important to note the water that appears on the embankment below Drain 7 and on the ground and all around Drain 8. The area below these drains is very wet and boggy and it appears that neither of these drains is functioning well. Photographs of the outside and inside of each of these drains are shown in Figure 11 below.

Figure 11: Drains 7 and 8: Outside and inside

Drain 9 and Drain 10: Drains 9 and 10 were previously labeled as Drain 7 and Drain 8 and are hereinafter labeled as Drain 9 and Drain 10. These drains are located together on the right side of the center of the embankment. Both drains were flowing water. The outside of the drains after cleaning is shown below. There is water flowing in a continuous flow and it is clear. The inside of Drain 9 is open but it is uncertain if there are gravel deposits in the drain. It seems as though there is a considerable amount of rust and corrosion in this pipe as it is an older corrugated metal pipe.

Drain 10 is a reinforced concrete pipe that is in good condition. There is water flowing in this drain and it is a steady flow and is clear as well. It appears as though there may be a gravel deposit in the upper end of this drain but it is not readily discernable. A photograph of the outside and inside of both of these drains is shown in Figure 12 and Figure 13 below.

Figure 12: Outside of Drains 9 and 10, Inside of Drain 9

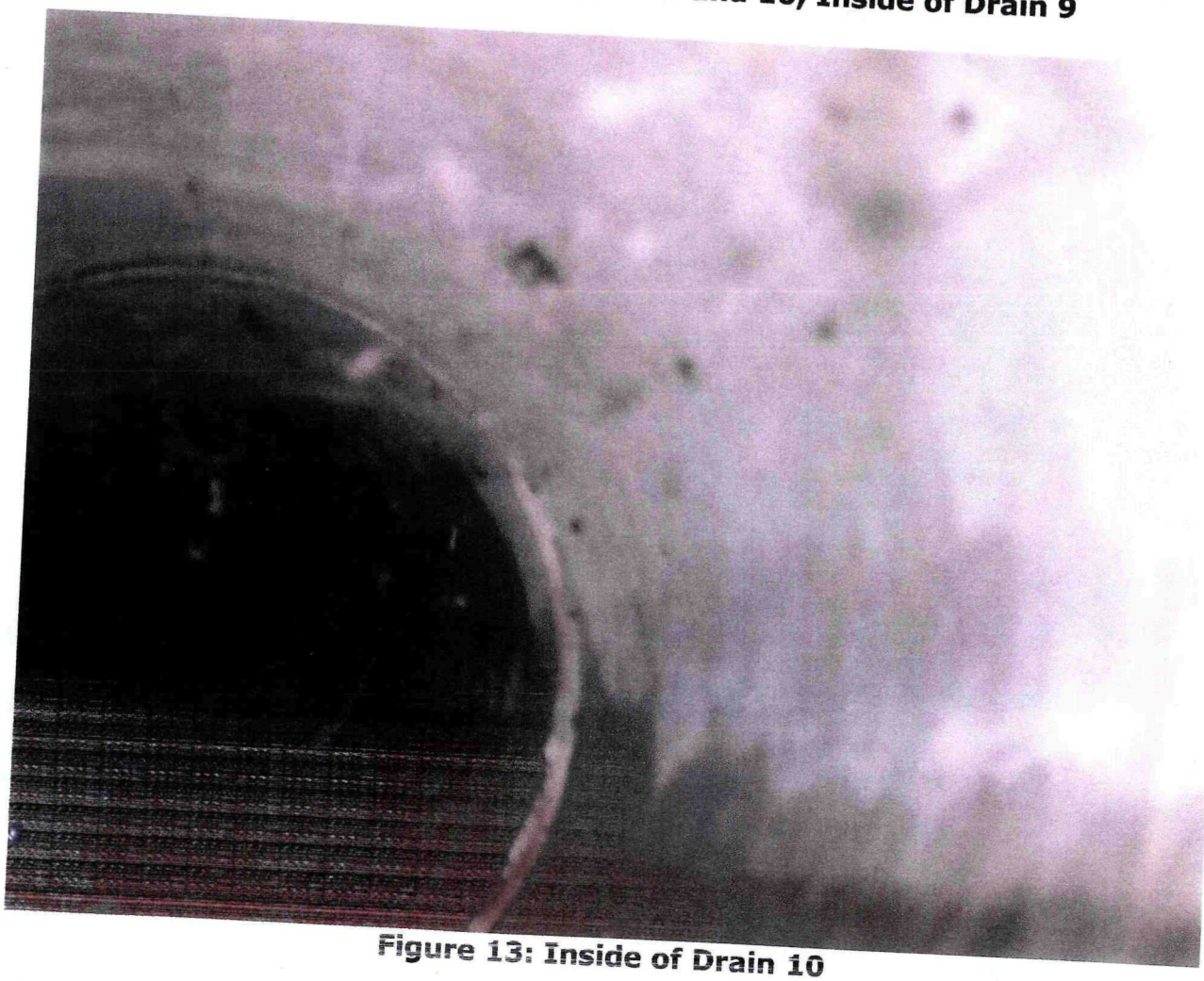


Figure 13: Inside of Drain 10

Drain 11: Drain 11 was previously labeled as Drain 9 and is hereinafter labeled as Drain 11. Drain 11 an 8-inch concrete pipe, flowing water. This drain is approximately 100 ft. to the left of the right groin in the dam. The inside of this drain appears over grown with roots. The roots can be seen extending from just

inside of the end of the pipe. The outlet of from this and the inside of the drain are shown in Figure 14 below:

Figure 14: Drain 11 outside and inside

Drain 12: Drain 12 was previously labeled as Drain 10 and is hereinafter labeled as Drain 12. This drain is the farthest drain to the right of the dam and is located at the toe of the right groin and embankment. This drain is an 8-inch concrete pipe. The inside of this drain is severely over grown with willow roots. A photograph of the outside of the drain is shown in Figure 15 below. It is important to note that the majority of the flow from this drain appears to the right of the drain and flows out of the ground. It is clear that the drainage in this area is mainly on the outside of the drain. A photograph of the flow from the ground surface next to the drain is also shown in Figure 15.

Figure 15: Outside of Drain 12

There was water still flowing around the root mass and out the pipe end but the majority was around and on the outside of the drain. The water flowing on the outside and the inside of this drain is shown in Figure 16 below.

Figure 16: Drain 12 water on the outside and roots on the inside of the drain

A V-notch weir was set below Drain 12. The weir read 1-3/4 inches 2 hours after the weir was set. A reading of 1-3/4 inches is 9.34 gpm. A photograph of the weir is shown in Figure 17 below.

Figure 17: Weir below Drain 12

Main Channel: The staff gauge was set in the channel that forms below all of the drains at a location where all of the flow from the drains is collected. A photograph of the staff gauge immediately after it was set and prior to final adjustment is shown in Figure 18 below. The staff gauge was readjusted to be plum and was pushed further down into the stream bead and eventually read 0.785 ft. approximately 3 hours after it was set. The flow was measured using a Marsh McBirney® Flow meter and was found to be 0.289 cfs (130 gpm).

Figure 19: Staff Gauge below all drains

Drain Table:

Shown below is Table 1 which lists all of the weir flow as measure on site and then provides an estimated flow for the remaining drains;

FLOW AT DRAIN	FLOW	CUMMULATIVE TOTAL FLOW
WEIR 1,2,3,&4	12.6 GPM	12.6 GPM
WEIR 5	2.35 GPM	14.95 GPM
WEIR 10	9.34 GPM	24.29 GPM
DRAINS 6,7,8,9,10, & 11	100 GPM (est.)	124.29 GPM
TOTAL FLOW AT GAUGE		**130 GPM**

Downstream Toe

The area downstream of the main embankment includes the area below the toe drain to the base of the concrete chute spillway. The area includes the stream from the drains, the left side access road, the right side access road area, and the stream down through the area to a culvert that goes under the access road that serves the left side of the dam. This is a large area that is heavily vegetated and is hard to inspect. A more thorough inspection of this area is planned for the spring of 2008 when the snow melts, before there are leaves on the trees.

The area that could be observed showed no obvious signs of unusual seepage, no signs of bulges or displaced material and no other concerns or anomalies that were noted.

DISCUSSION

A. Emergency Action Plan: The Emergency Action Plan is current.

B. Operational Plan:
A GPS reading of each of the piezometer locations was taken. The locations as shown on the "Recommended Piezometer Locations" Plate 1 from Harding Lawson September 1992 report will be corrected and the actual locations mapped. This map will be completed during the winter of 2007.

C. Crest:
The elevation survey of the berm of material that has been placed on the upstream and downstream edge of the crest found the berms are level from end to end on the dam. The purpose of the berms still has not been determined. As they are level they will provide a level "weir" surface should over topping ever occur. Until the purpose is determined, they do not need to be re-graded. Chapman Construction cleaned off the small trees and brush that had obscured the visual alignment of the crest and it is much easier to see the crest.

D. Upstream face:
Most of the vegetation was cleaned off the upstream face to make sure that the any trees and root balls are removed that may cause seepage paths to develop. This included the dead stumps that have been left from previous tree and brush removal and the small trees and brush that had obscured the piezometer locations and the ability to make a visual inspection of the upstream face. It is much easier to see the face and it will make for quicker inspections in the future.

E. Piezometers:
All of the vegetation has been cleaned away from around the piezometers and they can be more easily located. The top 2 feet of the piezometer casings still need to be dug out around the top of the casing and repacked with bentonite and soil. Each of the piezometers was painted with orange paint and a metal tag still needs be attached to each piezometer with the piezometer number shown on the tag. This project has been discussed and planned and will be completed by Chapman Construction during the spring of 2008.

F. Earthen Channel and Trash Rack above the Concrete Box Culvert:
The trash rack was inspected and will be checked by Chapman Construction for debris each year after runoff occurs and any time a major storm event moves through the area. All accumulations of debris that block more than 20% of the channel conveyance will be removed.

G. Concrete Box Culvert:
G.1. Entrance: The rocks at the entrance to the box culvert still need to be removed and the riprap on both sides will be stabilized. This project has been discussed and planned and will be completed by Chapman Construction during the spring of 2008.
G.2. Centerline Crack: The centerline crack was mapped and the width measured at each location. As discussed above, the data and crack map is provided in Exhibit 3 to

this report. This data will be invaluable in working to ascertain the cause of the crack and will provide a baseline to be able to monitor any change in crack width. The crack width monitoring results will be included in the operational permit renewal report.

G.4. Expansion Joints: The expansion joint material in the transverse expansion joints was scraped out, cleaned well, and re-caulked with a SikaFlex® concrete crack repair caulk. The material missing from the vertical joints on the right side, as shown in photograph E3-21 of the May 23, 2007 Annual Owners Inspection Report were also cleaned and replaced and re-caulked. This project is complete.

H. Concrete Chute Spillway:

H.1. Transverse Cracks in Side Walls: Chapman Construction is currently working on cleaning and caulking of these cracks. It is anticipated this project will be done before December 1st, 2007.

H.2. Spalled Sections: The larger pieces of concrete that have spalled off of the right sidewall still needs to be saw cut, cleaned and repaired. This project will be completed by Chapman Construction before December 1st, 2007.

H.3. Open Chute: The earth backfill next to the open chute spillway still needs to be re-graded so that the wall tops are above the local grade at least 3 to 4 inches. The ground should be sloped so that water will not collect on the wall tops and weeds and plants that grow next to the walls have less of a chance to hold moisture on the wall tops and allow freeze thaw damage to occur. This project was discussed with Chapman Construction should be completed before the fall of 2008.

I. Downstream Face:

The downstream face is in good to excellent condition. The drain on the top of the first lift was cleaned around the edges so that trash and debris can easily move through the entrance. A top hat grate still needs to be installed to keep debris out of the culvert. It should be inspected each time someone is on site to be sure it is free flowing.

J. Toe Drains:

A total of twelve (12) toe drains were exposed and identified in this report. As discussed above, the inside of many of the drains appeared to be partially or fully blocked with tree roots and/or debris. Photographs of the insides of the pipes were taken but the distances and degree of blockage could not be determined. The blockage appears to be considerable enough to have caused water to flow to the outside of Drains 2, Drains 7 and 8, Drain 11 and Drain 12 as a minimum. Wet areas were also noted on the outside of Drains 5, 9, and 10. We have determined that the inside of each of the toe drains need to be cleaned but further investigation is needed to determine the best and most careful way to do the work.

K. Monitoring: The piezometers should continue to be monitored and recorded on a monthly basis. The V-notch weirs were installed on the three left groin drains and on the right 8-inch concrete culvert drain and they will need to be monitored each time the piezometers are monitored.

A staff gauge was placed in the channel where all of the flow collects. The staff gauge needs to be read each time the piezometers and weirs are read.

CONCLUSIONS AND RECOMMENDATIONS

It is the conclusion of Billmayer & Hafferman Engineering that the overall condition of the Kootenai Development Impoundment Dam remains good to very good. The crest, upstream face, downstream face, concrete spillway and earthen auxiliary spillway are all in good to very good condition. The maintenance and repair projects completed in the fall of 2007 have made vast improvements in the ability to easily and rapidly see the major elements in the dam. The crack mapping in the box culvert will provide an excellent baseline for further monitoring of this anomaly. The cleaning and sealing of the transverse joints in the box culvert will clearly extend the life of this structure. Work planned to be completed before December 1st in the open concrete chute spillway will continue to improve the over all condition of the spillway concrete and will help to facilitate efficient and effective inspections.

The blockage and debris in the drains was recently detected but has apparently been present for a while. As the phreatic water surface in the dam remains low they do not appear to be causing long term effects yet but they must be cleared to assure no future problems with high phreatic water surface. The development of any cleaning or repair alternative will first depend on the results of a camera investigation of the interior of the pipes.

We continue to recommend that we install more sensitive and continuous recording pressure transducers in at least piezometers A8 and P2 prior to the project so that any reactions in the phreatic water surface before and after the cleaning or repair operations can be monitored and reported. We believe that the phreatic water surface should drop after the drains are cleaned but it will be important to have a continuous accurate record before and after to be able to show the results and monitor the changes. It is recommended that the transducers be installed in March of 2008.

The project to get the drains inspected and a cleaning or repair alternative were presented in the September 26th, 2007 report and have not essentially changed other than to remove the requirements to remove more of the vegetation at the toe drain area. As there has been an initial resistance from the EPA to removing vegetation in this area, a means to camera the drains without vegetation removal will be investigated. The tasks presented in the September report, modified to take out the tree removal are shown below.

1. LCD 310 Permit Application and Meetings: This task has been completed and a permit has been issued. We have permission to work in the stream bed and banks from the Lincoln Conservation District.
2. Preconstruction Monitoring: Install continuous recording pressure transducers in at least piezometers A8 and P2 prior to the project to track reactions in the phreatic water. A budget has been developed for this project.

3. DEQ requested the water quality in the drains be tested for asbestos transport prior to and after the drains are cleaned. It is understood that recent water quality samples were taken and the results will be provided to Billmayer & Hafferman Engineering and Remedium Inc. will be responsible for forwarding to the DEQ. Billmayer & Hafferman Engineering has not provided a budget for this item.

4. Camera Inspection: This task will use a small diameter video camera on a push pole to investigate as far into each drain as is possible. We will be prepared to go as far as 50 ft. into each drain if the camera can be safely maneuvered around the existing blockage or debris. This task will result in a video on a DVD of each drain.

5. Video from the camera will allow analysis of the blockage or debris in each drain and determine its length and location in the drain pipe as well as an analysis of the condition of each of the drain pipes.

6. Project Results Report: A report on the inspections, the results, including recommended cleaning or repair alternatives will be completed. Results of the water quality sampling will be reported, the DNRC Dam Safety program will be provided the reports and videos, and the LCD will be provided with a notice of completion. The monitoring results, the videos, the final result discussion, and copies of all permit and close out documents will be provided to Remedium Inc. A modified budget for this project is presented below.

TASK	***ESTIMATED COST***
1. Pre and post construction water level monitoring and analysis	$3,010
2. Drain location survey	$1,600
3. Drain inspection with camera	$7,670
4. Analysis of drain inspection videos, maps of the drain locations at the toe, and plots of the blockage locations in each drain	$7,420
5. Project Results Report with repair alternatives.	$2,360
Estimated Costs	**$22,060**

DAM SAFETY COMPLIANCE

With the implementation of monthly monitoring by Billmayer & Hafferman Engineering Inc., the project is currently in compliance with all Montana Dam Safety requirements.

The drains will need to be cleaned and be free flowing prior to the five year operational permit inspection.

Preparation for the 5-year operational permit renewal inspection is still on track and the operational permit inspection should be conducted in the early fall of 2008.

EXHIBITS

EXHIBIT 1

Field Notes

KOOTENAI INDIAN TRIBE

11/8/2007 THURSDAY

~~[illegible]~~ KH

R.56.1

BOX CULVERT CROSS MAP

11/8/07 THURS.

HAFFERMAN & Robertson

ON SITE @ 1010 CRACK IN BOX CULVERT — COOL, RAIN

DIST (D)	WALL DIST (wd)	WIDTH (W)	DEPTH (Dp)
0.0	49 1/2	.0325	1/16
7.4	51	.0415	1/8
9.7	47 1/2	.0655	5/16
13.9	31 1/2	.070	5/16
17.9	38 1/4	.105	9/16
21.15	44 1/2	.140	15/16
26.5	45 1/4	.204	1 7/16
28.65	49	.171	1 3/4
31.4	41	.095	11/16
34.35	42 1/8	.0745	5/8
37.2	38 1/4	.109	5/8
40.1	41 5/8	.165	1 1/2

HAFFERMAN TAKING MEASUREMENTS

Robertson recording in book.

200 ft. Fiberglass tape
25 ft. Steel tape

Crack displaced 3/16

DIST.	WALL D.	C. WIDTH	DEPTH
41.7	44 1/2	.167	1 1/2
42.0	Transverse	JOINT	
42.1	46 1/2	0.195	1 1/2"
44	47 1/2	.210	5/8
48.9	52 1/2	.118	1 1/4
54.35	39 1/2	.131	2
58.35	42 3/8	.118	1 5/8

AT TRANSVERS crack

32" → .245 81

46 1/2 →

44 1/4 →

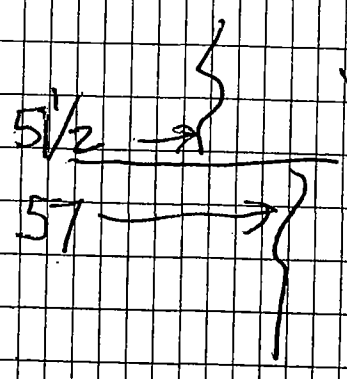
5/32

Dist	Wall O.	C. width	Depth
72.15	39 1/2	.069	5/8
79.2	61 1/2	.193	1 3/8
84	52	.216	1 3/8
91.3	45 3/4	.144	1 1/4
97.4	44 7/8	.145	9/16
105.2	47	.176	1 1/16
110.4	54	.11	7/16
112.1	42 1/4	.131	5/8

6/32

CORCK displaced 1/8

@ 2nd transverse joint crack displaced



Dist	Wall @	Width	Depth
116.75	37 1/2	.177	1 1/16
122.8	34 7/8	.176	1 1/16
123.3	35	.155	7/8
126	43 1/2	.123	3/4
126.1	55 1/2	.070	1/4
129.6	55	.119	5/16
134.25	50 3/8	.113	3/4
137.85	56	.075	1/8

Crack displaced 1/8 left @ transverse joint #3

43 1/2 }

55 1/2 }

9/32

Dist	Wall O	Cw. dpth	depth
143.65	43 1/2	.162	5/16
147.8	41 1/2	.017	1/16
150.9	56 1/2	.058	1/8
154.65	44	.058	1/4
157.5	39 1/2	.0435	1/16
160.95	56 1/2	.029	1/32
165.85	47 1/2	.028	1/32
168.0	54 1/2	.046	1/8

10/32

Last transverse joint
END

11/32

START OPEN CHUTE

PIEZ

P	102.35	dry	
P1	104	dry	
P2	121.3	wet	122.5
P3	60.3	dry/wet	
P4	106	dry/wet	
P5	105	dry	
L Top left gm	65.0	dry	
℄ Top Liff	104	dry	

12/32

3rd lift left joint	50 ft	wet-dry
2nd lift left joint	41.0	dry
	57.5	dry
℄ 2nd lift		
right of ℄ 2nd lift	51.65	wet
		54.9 bot
A8 - 8.75		18 bot

D1 dry 2 photo

D2 wet ~5gpm 2P

D3 wet/dry 2P

D4 ~10gpm 2P

CMP

CMP

seeps at bottom

conc. 10" to D

D4 - 8" conc. wall = 12"

Rec weir 1 1/2"

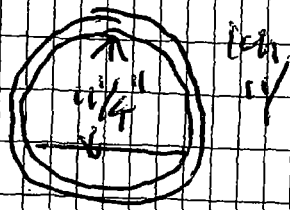
D5 flow ~5 gpm
V-notch 3/4"

D6 1 3/4 Steel 2P

Below 1-4

12" cmp
3P

W: 1 1/4"



$D6_a$ 13 1/4" 5 tee

$D6_{2a}$ 10" conc drg

$D6_{2b}$ 10" cmp wet 2 gpm

1, D_6

D7 10" conc
good flow ±
10 gpm

D8 12" cmp
20 gpm

D9 10" Conc.
15 gpm

W10 1 3/4" V-notch

2P

DIO - 1 5gpm in
pipe

10 gpm available

Stream gauge

GH – 0.785

DIST	WIDTH	dep.	AREA	V.	DIS (cfs)
.8	0.25	0	0	0	0
1.3	0.35	.2	0.07	.26	.0182
1.5	.35	.29	.1015	.37	.0376
2.0	0.40	.29	.116	.24	.0278
2.3	.40	.31	.124	.38	.0471

.25

.1

.25

.15

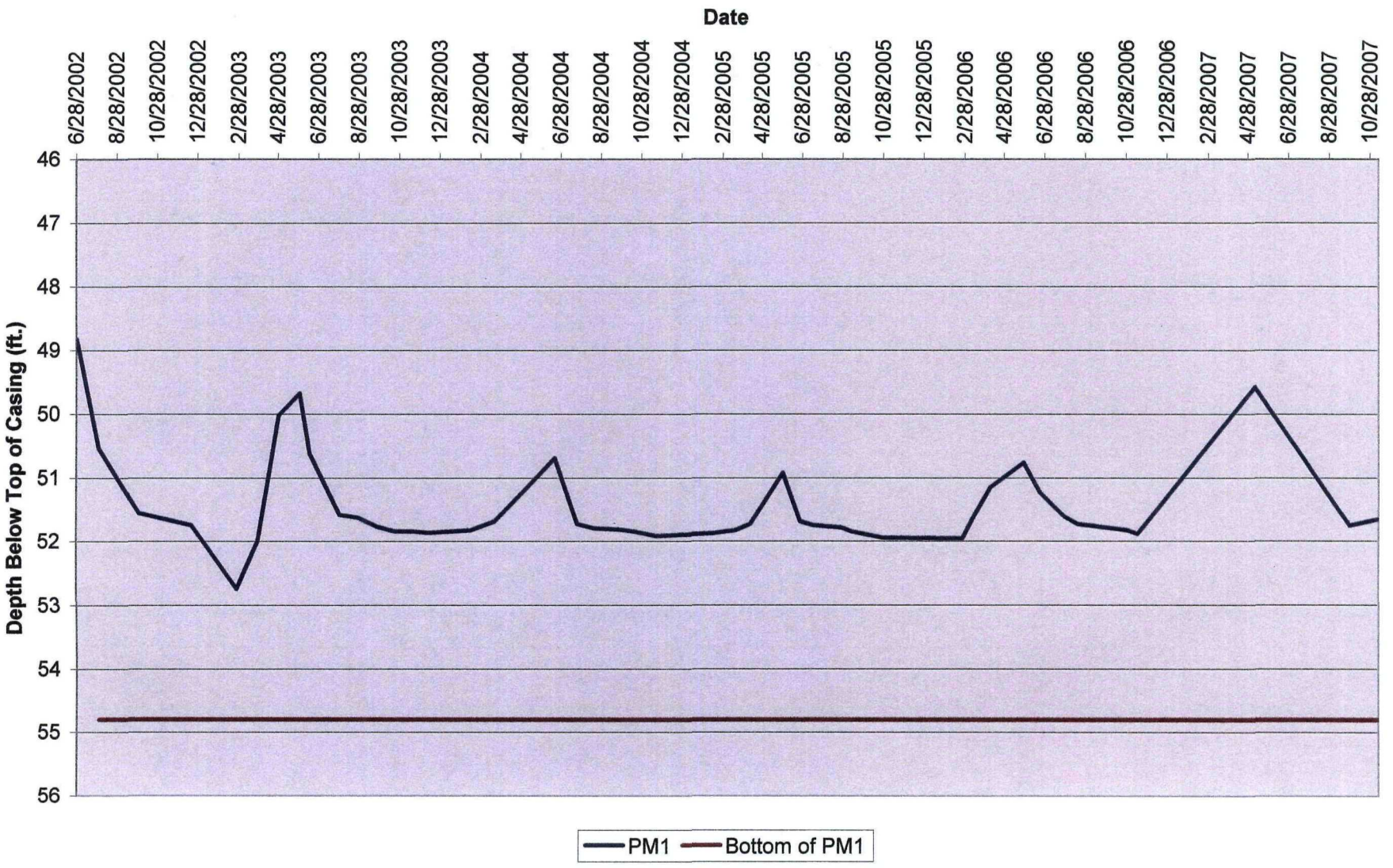
.25

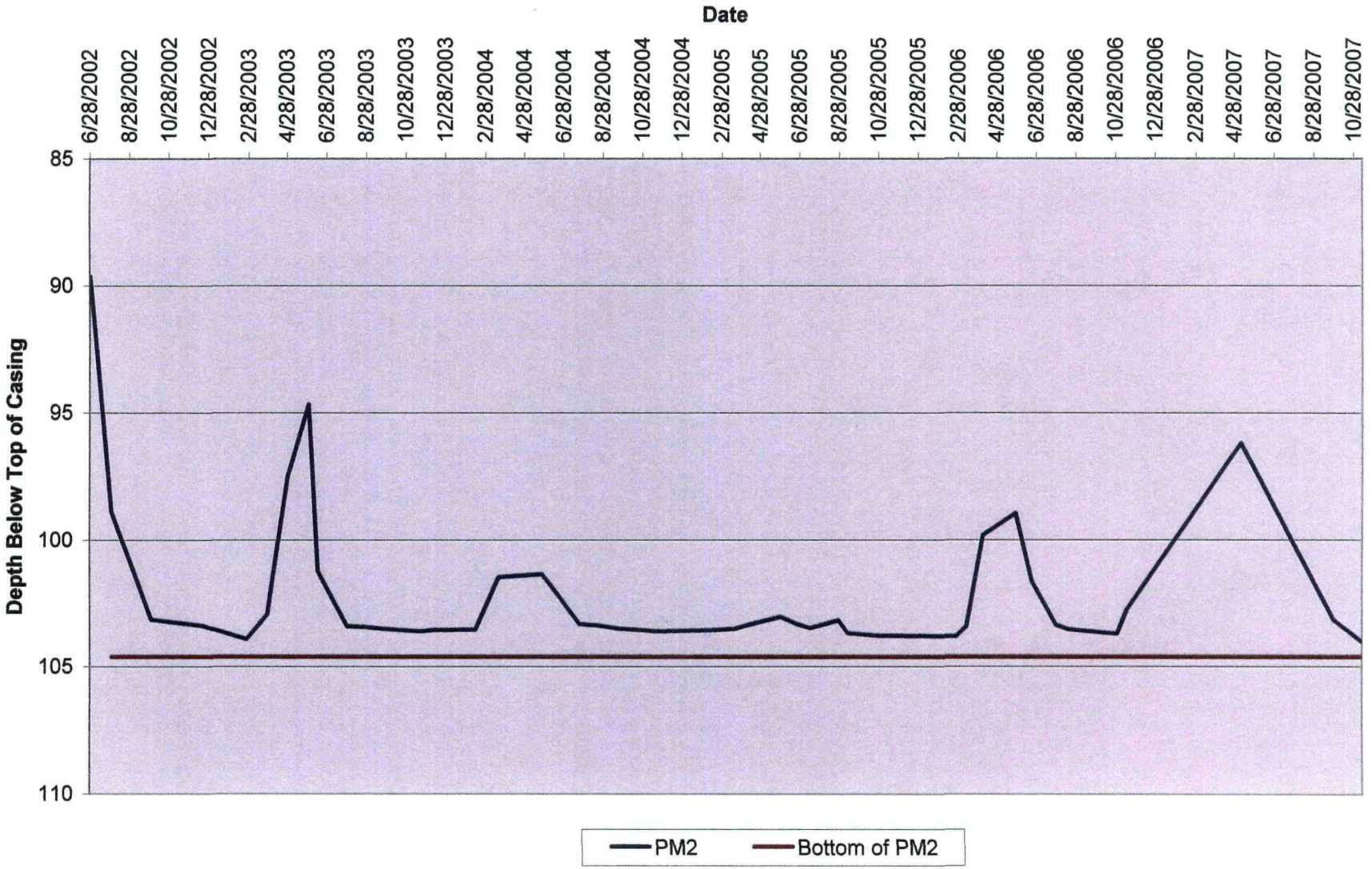
Dist	Depth	Width	V.	Area	Q
2.8	.25	.35	4.15	.0875	.1006
.1					
3.0	.25	.25	.83	.050	.0415
.15					
3.3	.2	.30	.1	.06	.006
.15					
3.6	0	.15	0		

$Q_{CFS} = 0.289$

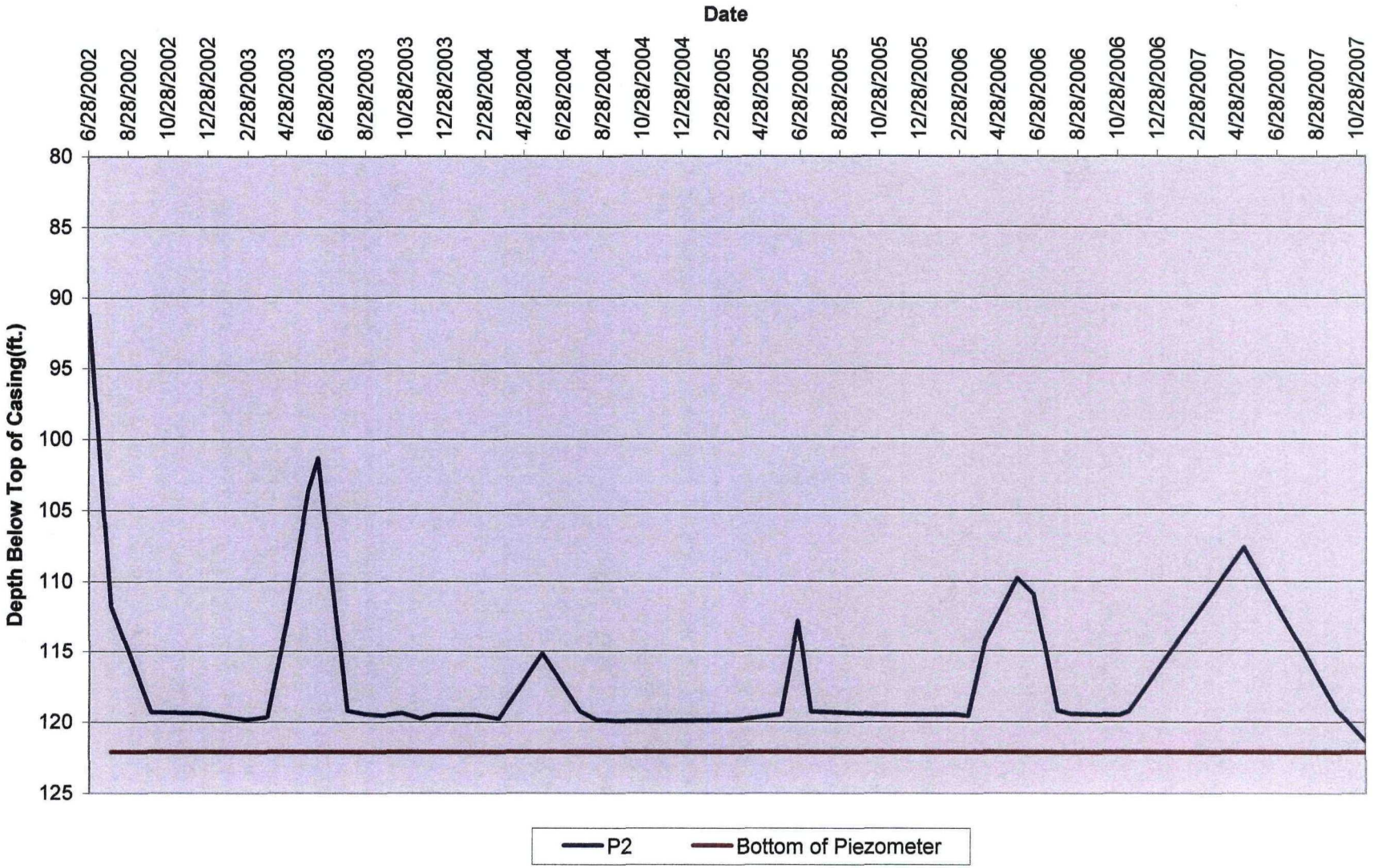
$Q_{GPM} = 130$

Exhibit 2
Piezometer Data and Piezometer Plots

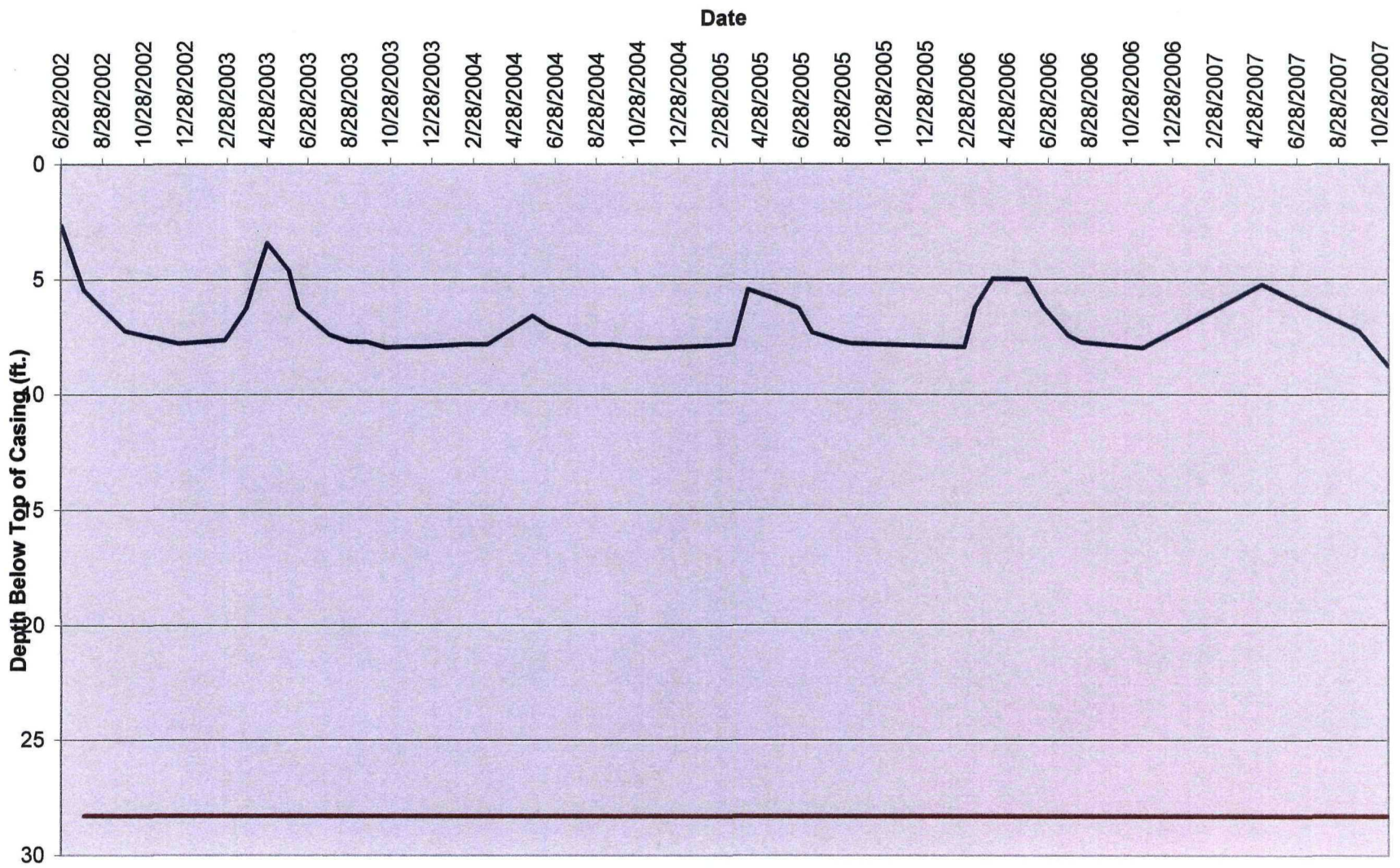

Depth to Water in PM1
Date
6/28/2002
8/28/2002
10/28/2002
12/28/2002
2/28/2003
4/28/2003
6/28/2003
8/28/2003
10/28/2003
12/28/2003
2/28/2004
4/28/2004
6/28/2004
8/28/2004
10/28/2004
12/28/2004
2/28/2005
4/28/2005
6/28/2005
8/28/2005
10/28/2005
12/28/2005
2/28/2006
4/28/2006
6/28/2006
8/28/2006
10/28/2006
12/28/2006
2/28/2007
4/28/2007
6/28/2007
8/28/2007
10/28/2007
Depth Below Top of Casing (ft.)
46
47
48
49
50
51
52
53
54
55
56
PM1
Bottom of PM1


Depth to Water in PM2
Date
6/28/2002
8/28/2002
10/28/2002
12/28/2002
2/28/2003
4/28/2003
6/28/2003
8/28/2003
10/28/2003
12/28/2003
2/28/2004
4/28/2004
6/28/2004
8/28/2004
10/28/2004
12/28/2004
2/28/2005
4/28/2005
6/28/2005
8/28/2005
10/28/2005
12/28/2005
2/28/2006
4/28/2006
6/28/2006
8/28/2006
10/28/2006
12/28/2006
2/28/2007
4/28/2007
6/28/2007
8/28/2007
10/28/2007
Depth Below Top of Casing
85
90
95
100
105
110
PM2
Bottom of PM2

Depth to Water in P2



Depth to Water in Piezometer A8



BILLMAYER ENGINEERING
KOOTENAI IMPOUNDMENT DAM R.56.1
FALL 2007 MAINTENANCE PROJECTS
HAFFERMAN
SEPTEMBER 27, 2007 PIEZOMETER READINGS

Piezometer Number	DISTANCE TO WS	TOTAL DEPTH	WET	DRY	WATER COLUMN DEPTH
P-O	NA	NA			
P1		103.93		DRY	
P2	110.23	122.1	WET		11.87
P3		60.7		DRY	
P4	106	106.2	WET		0.2
P5	104.01	104.3	WET		0.29
PM1		54.8		DRY	
PM2	103.12	104.6	WET		1.48
PM3		51.8		DRY	
PM4		41.12		DRY	
PM5		49.57		DRY	
PM6		65.69		DRY	
A8	7.22	28.3	WET		21.08

BILLMAYER & HAFFERMAN ENGINEERING
KOOTENAI IMPOUNDMENT DAM R.56.1
NOVEMBER 9, 2007 ROUTINE INSPECTION
HAFFERMAN
NOVEMBER 9, 2007 PIEZOMETER READINGS

Piezometer Number	DISTANCE TO WS	TOTAL DEPTH	WET	DRY	WATER COLUMN DEPTH
P-O	NA	NA			
P	DRY	102.35		DRY	
P1		104		DRY	
P2	121.3	122.5	WET		1.2
P3	DRY	60.3		DRY	
P4	106	106.2	WET		0.2
P5	104.01	104.3	WET		0.29

PM1	DRY	65		DRY	
PM2	DRY	104			
PM3		50.3		DRY	
PM4		41.12		DRY	
PM5		49.57		DRY	
PM6		65.69		DRY	
A8	8.75	28.3	WET		19.55

Billmayer Engineering
Kootenai Impoundment Dam Annual Inspection
23-May-07
Hafferman
Wet Piezometer Plots

Piezometer	P2		PM1		PM2		A8	
Date	DW	TD	DW	TD	DW	TD	DW	TD
11/9/2007	121.3	122.1	51.65	54.8	104	104.6	8.75	28.3
9/27/2007	119.12	122.1	51.75	54.8	103.12	104.6	7.22	28.3
5/8/2007	107.64	122.1	49.57	54.8	96.18	104.6	5.22	28.3
11/14/2006	119.21	122.1	51.88	54.8	102.72	104.6	7.96	28.3
10/30/2006	119.48	122.1	51.82	54.8	103.69	104.6	7.92	28.3
8/16/2006	119.39	122.1	51.72	54.8	103.51	104.6	7.72	28.3
7/28/2006	119.14	122.1	51.61	54.8	103.32	104.6	7.42	28.3
6/21/2006	110.89	122.1	51.23	54.8	101.62	104.6	6.18	28.3
5/27/2006	109.78	122.1	50.76	54.8	98.92	104.6	4.98	28.3
4/7/2006	114.34	122.1	51.14	54.8	99.79	104.6	4.96	28.3
3/12/2006	119.52	122.1	51.62	54.8	103.39	104.6	6.18	28.3
2/24/2006	119.44	122.1	51.95	54.8	103.79	104.6	7.92	28.3
10/27/2005	119.41	122.1	51.94	54.8	103.76	104.6	7.81	28.3
9/10/2005	119.32	122.1	51.84	54.8	103.66	104.6	7.76	28.3
8/27/2005	119.3	122.1	51.78	54.8	103.14	104.6	7.68	28.3
7/14/2005	119.22	122.1	51.74	54.8	103.46	104.6	7.28	28.3
6/24/2005	112.79	122.1	51.68	54.8	103.29	104.6	6.22	28.3
5/29/2005	119.42	122.1	50.92	54.8	103.01	104.6	5.91	28.3
4/10/2005	119.7	122.1	51.72	54.8	103.32	104.6	5.42	28.3
3/19/2005	119.82	122.1	51.82	54.8	103.49	104.6	7.79	28.3
2/13/2005	119.86	122.1	51.87	54.8	103.54	104.6	7.86	28.3
11/19/2004	119.9	122.1	51.91	54.8	103.59	104.6	7.96	28.3
10/17/2004	119.89	122.1	51.84	54.8	103.52	104.6	7.91	28.3
9/24/2004	119.91	122.1	51.81	54.8	103.49	104.6	7.82	28.3
8/17/2004	119.84	122.1	51.79	54.8	103.34	104.6	7.79	28.3
7/22/2004	119.21	122.1	51.72	54.8	103.29	104.6	7.42	28.3
6/18/2004	116.8	122.1	50.69	54.8	102.14	104.6	7.01	28.3
5/25/2004	115.14	122.1	50.95	54.8	101.34	104.6	6.55	28.3
3/19/2004	119.74	122.1	51.68	54.8	101.46	104.6	7.8	28.3
2/12/2004	119.45	122.1	51.82	54.8	103.52	104.6	7.8	28.3
12/10/2003	119.44	122.1	51.86	54.8	103.54	104.6	7.91	28.3
11/19/2003	119.72	122.1	51.84	54.8	103.59	104.6	7.9	28.3
10/21/2003	119.32	122.1	51.84	54.8	103.54	104.6	7.94	28.3
9/23/2003	119.51	122.1	51.76	54.8	103.49	104.6	7.7	28.3
8/26/2003	119.42	122.1	51.62	54.8	103.42	104.6	7.68	28.3
7/29/2003	119.16	122.1	51.58	54.8	103.38	104.6	7.39	28.3
6/14/2003	101.34	122.1	50.62	54.8	101.23	104.6	6.22	28.3
5/30/2003	103.62	122.1	49.67	54.8	94.67	104.6	4.62	28.3
4/28/2003	112.74	122.1	50.02	54.8	97.48	104.6	3.41	28.3
3/28/2003	119.62	122.1	51.99	54.8	102.91	104.6	6.21	28.3
2/24/2003	119.82	122.1	52.74	54.8	103.9	104.6	7.62	28.3
12/18/2002	119.34	122.1	51.74	54.8	103.36	104.6	7.77	28.3
9/30/2002	119.28	122.1	51.55	54.8	103.12	104.6	7.22	28.3
7/31/2002	111.72	122.1	50.54	54.8	98.87	104.6	5.46	28.3
6/28/2002	91.22	122.1	48.82	54.8	89.63	104.6	2.62	28.3

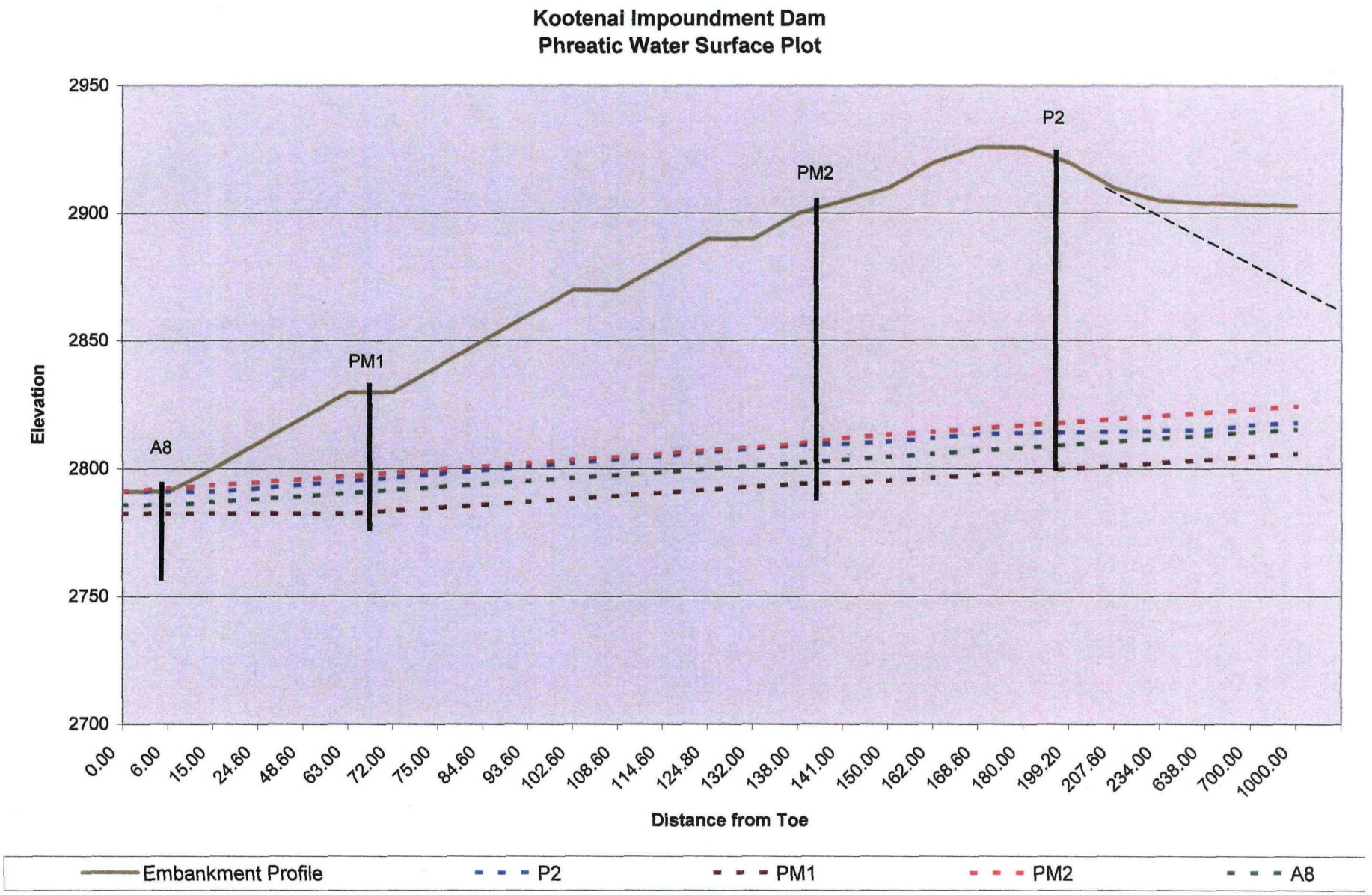
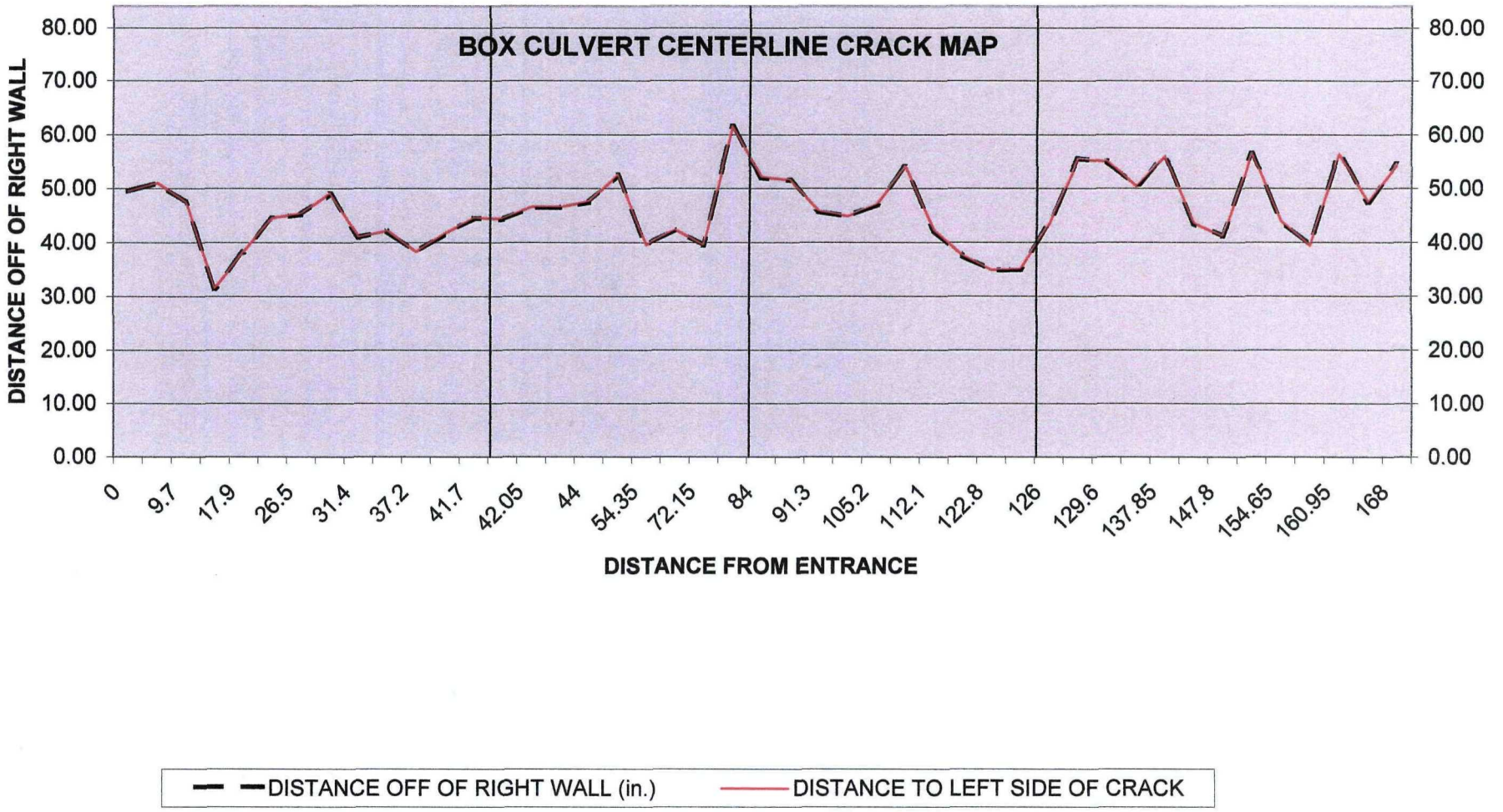

Kootenai Impoundment Dam
Phreatic Water Surface Plot
2950
2900
2850
2800
2750
2700
Elevation
A8
PM1
PM2
P2
0.00
6.00
15.00
24.60
48.60
63.00
72.00
75.00
84.60
93.60
102.60
108.60
114.60
124.80
132.00
138.00
141.00
150.00
162.00
168.60
180.00
199.20
207.60
234.00
638.00
700.00
1000.00
Distance from Toe
Embankment Profile
P2
PM1
PM2
A8

Exhibit 3
Box Culvert Crack Data and Crack Plot

KOOTEMAI IMPOUNDMENT DAM
BOX CULVERT CRACK MAP
November 8, 2007

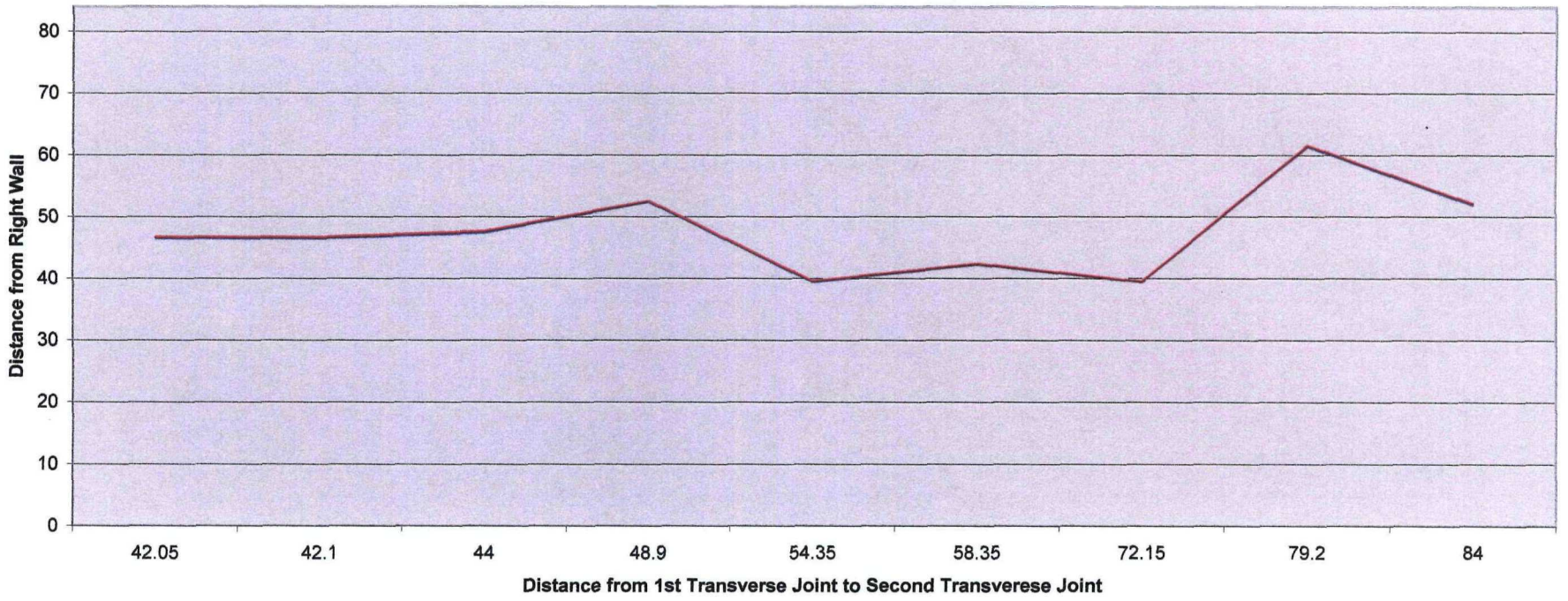
Hafferman and Robertson

DISTANCE FROM ENTRANCE TO BOX CULVERT	DISTANCE OFF OF RIGHT WALL (in.)	DISTANCE OFF WALL (ft.)	CRACK WIDTH (in.)	DISTANCE TO LEFT SIDE OF CRACK	CRACK DEPTH (in.)	
0	49.5	4.125	0.0325	49.5325	0.0625	
7.4	51	4.250	0.0415	51.0415	0.1250	
9.7	47.5	3.958	0.0655	47.5655	0.3125	
13.9	31.5	2.625	0.0700	31.5700	0.3125	
17.9	38.25	3.188	0.1050	38.3550	0.5625	
21.15	44.5	3.708	0.1400	44.6400	0.9375	
26.5	45.25	3.771	0.2040	45.4540	1.4375	
28.65	49	4.083	0.1710	49.1710	1.7500	
31.4	41	3.417	0.0950	41.0950	0.6875	
34.35	42.125	3.510	0.0745	42.1995	0.6250	
37.2	38.25	3.188	0.1090	38.3590	0.6250	
40.1	41.625	3.469	0.1650	41.7900	1.5000	
41.7	44.5	3.708	0.1670	44.6670	1.5000	
42	44.25	3.688	0.2475	44.4975	1.5000	TRANSVERSE JOINT 1
42.05	46.5	3.875	0.2475	46.7475	1.5000	
42.1	46.5	3.875	0.1985	46.6985	1.5000	
44	47.5	3.958	0.2100	47.7100	0.6250	
48.9	52.5	4.375	0.1180	52.6180	1.2500	
54.35	39.5	3.292	0.1310	39.6310	2.0000	
58.35	42.375	3.531	0.1180	42.4930	1.6250	
72.15	39.5	3.292	0.0690	39.5690	0.6250	
79.2	61.5	5.125	0.1930	61.6930	1.3750	
84	52	4.333	0.2160	52.2160	1.3750	TRANSVERSE JOINT 2
84.1	51.5	4.292	0.2160	51.7160	1.3750	
91.3	45.75	3.813	0.1440	45.8940	1.2500	
97.6	44.875	3.740	0.1450	45.0200	0.5625	
105.2	47	3.917	0.1760	47.1760	1.0625	
110.4	54	4.500	0.1100	54.1100	0.4375	
112.1	42.25	3.521	0.1310	42.3810	0.6250	
116.75	37.5	3.125	0.1770	37.6770	1.0625	
122.8	34.875	2.906	0.1760	35.0510	1.0625	
123.3	35	2.917	0.1550	35.1550	0.8750	
126	43.5	3.625	0.1230	43.6230	0.7500	TRANSVERSE JOINT 3
126.1	55.5	4.625	0.0900	55.5900	0.2500	
129.6	55	4.583	0.1190	55.1190	0.3125	
134.25	50.375	4.198	0.1130	50.4880	0.7500	
137.85	56	4.667	0.0750	56.0750	0.3125	
143.65	43.5	3.625	0.1620	43.6620	0.3125	
147.8	41.2	3.433	0.0170	41.2170	0.0625	
150.9	56.5	4.708	0.0580	56.5580	0.1250	
154.65	44	3.667	0.0580	44.0580	0.2500	
157.5	39.5	3.292	0.0435	39.5435	0.0625	
160.95	56.5	4.708	0.0290	56.5290	0.0318	
165.85	47.5	3.958	0.0280	47.5280	0.0318	
168	54.5	4.542	0.0460	54.5460	0.1250	

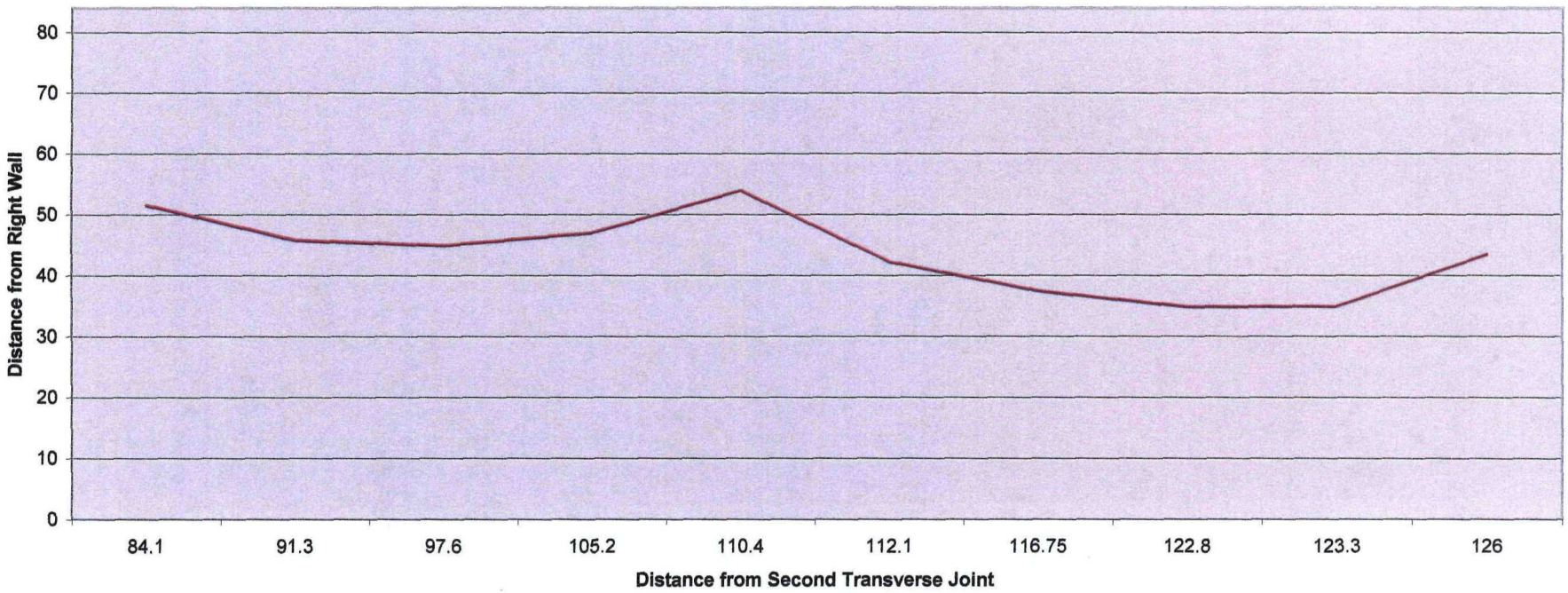

BOX CULVERT CENTERLINE CRACK MAP
DISTANCE OFF OF RIGHT WALL
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
0
9.7
17.9
26.5
31.4
37.2
41.7
42.05
44
54.35
72.15
84
91.3
105.2
112.1
122.8
126
129.6
137.85
147.8
154.65
160.95
168
DISTANCE FROM ENTRANCE
DISTANCE OFF OF RIGHT WALL (in.)
DISTANCE TO LEFT SIDE OF CRACK

Kootentai Impoundment Dam Box Culvert Crack Map First Section

Kootenai Impoundment Dam Crack Map Second Section



Kootenai Impoundment Dam Box Culvert Third Section Crack Map



Kootenai Impoundment Dam Box Culvert Crack Map Fourth Section

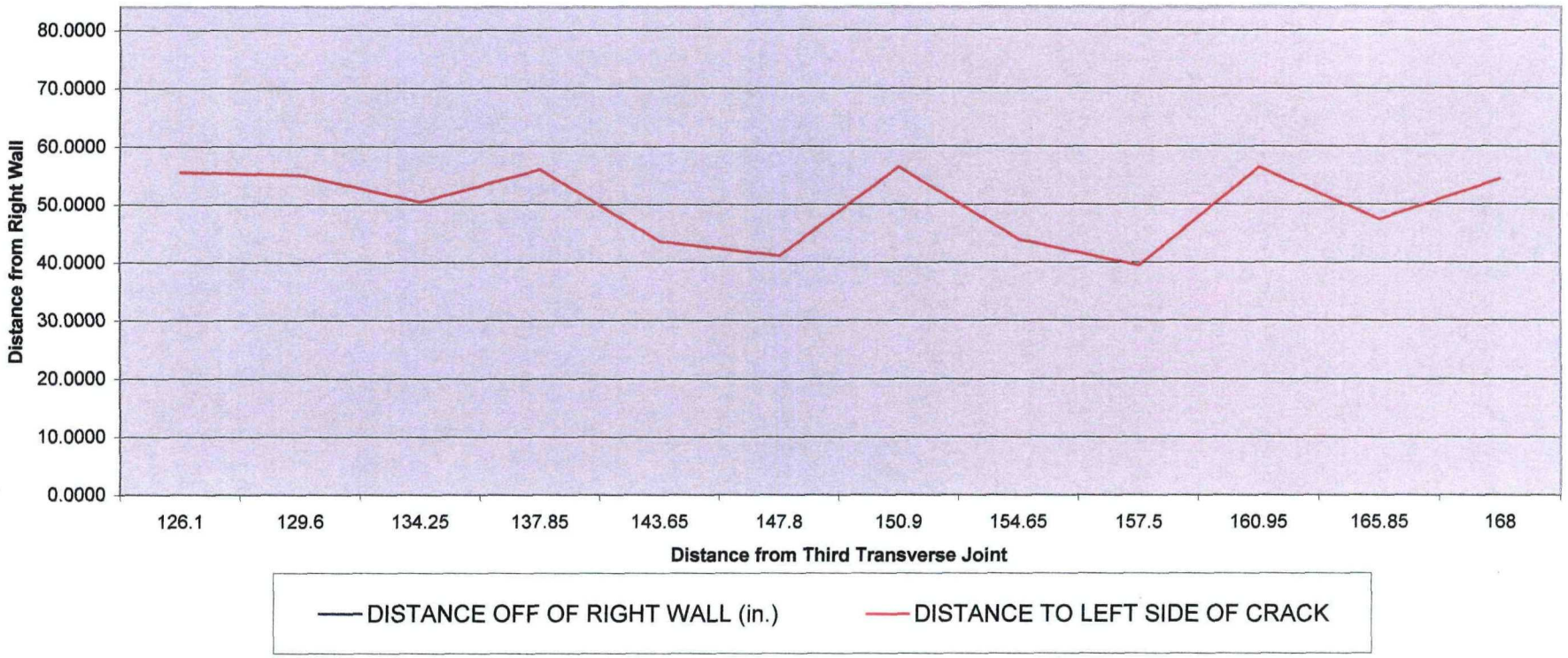


Exhibit 4
Photographs


26 1:15PM


26 1:19PM


26 1:23PM


26 1:11PM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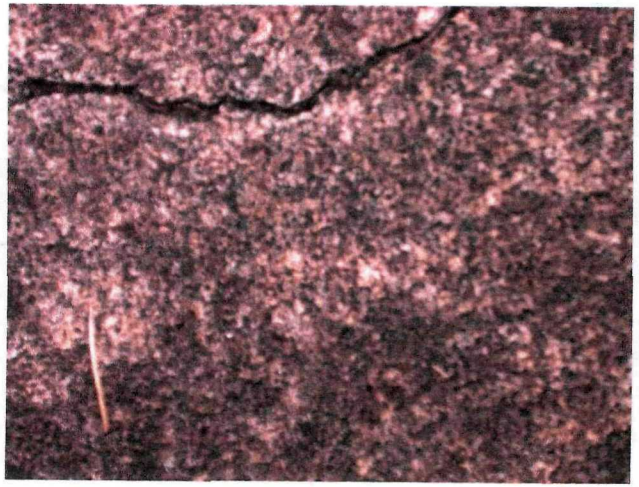
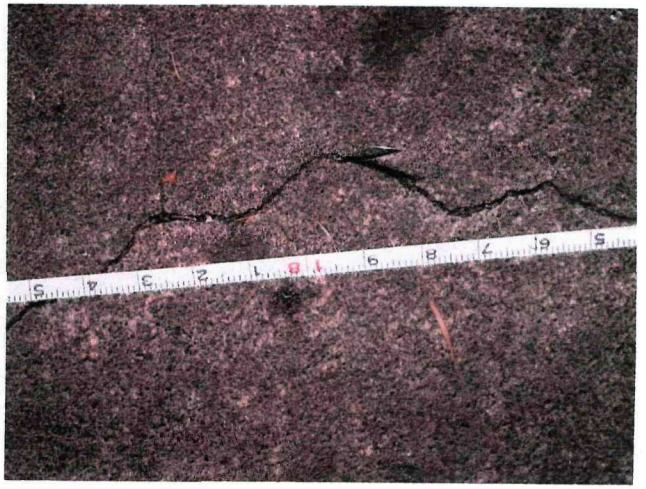
1:07PM


26 1:15PM


26 1:25PM



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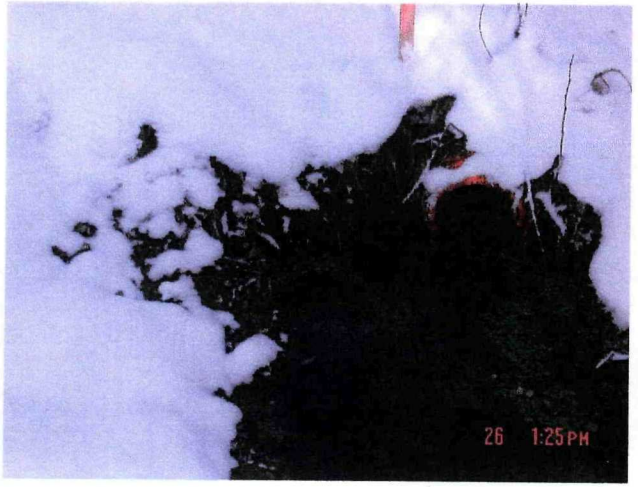
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